Material Safety Data Sheet
Ammonium hydroxide water solution, \(\geq 14\text{N NH}_4\text{OH} \geq 25\% \text{ as ammonia, NH}_3\)

MSDS# 00211

Section 1 - Chemical Product and Company Identification

MSDS Name: Ammonium hydroxide water solution, \(\geq 14\text{N NH}_4\text{OH} \geq 25\% \text{ as ammonia, NH}_3\)
AC205840000, AC205840010, AC205840025, AC205840050, AC255210000, AC255210010
A669-612GAL, A669C-212, A669C-212LC, A669J-500, A669S-212, A669S-212LC, A669S-500,
A669S212EA, NC9847335, SCH1143

Synonyms: Ammonium hydrate; Ammonia solution; Ammonia water; Aqueous ammonia; Aqua ammonia.

Company Identification: Fisher Scientific
One Reagent Lane
Fair Lawn, NJ 07410

For information in the US, call: 201-796-7100
Emergency Number US: 201-796-7100
CHEMTREC Phone Number, US: 800-424-9300

Section 2 - Composition, Information on Ingredients

Risk Phrases:
CAS#: 7664-41-7
Chemical Name: Ammonia
%: \(\geq 25\)
EINECS#: 231-635-3

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Danger! Harmful if swallowed. May cause pulmonary edema. Causes burns by all exposure routes. Toxic if inhaled. Very toxic to aquatic organisms. Target Organs: Blood, kidneys, heart, central nervous system, liver, respiratory system, gastrointestinal system, eyes, skin.
Potential Health Effects

Eye: Causes eye burns. Lachrymator (substance which increases the flow of tears).

Skin: Causes skin burns. May be harmful if absorbed through the skin.

Ingestion: Harmful if swallowed. Causes gastrointestinal tract burns. Causes throat constriction, vomiting, convulsions, and shock.

Inhalation: Causes chemical burns to the respiratory tract. Toxic if inhaled. May produce cardiac failure and pulmonary edema. May cause central nervous system effects.

Chronic: May cause liver and kidney damage. Laboratory experiments have resulted in mutagenic effects. Chronic exposure may cause blood effects. Animal studies have reported the development of tumors.

Section 4 - First Aid Measures

Eyes: Immediately flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid immediately.

Skin: Get medical aid immediately. Immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes.

Ingestion: Do not induce vomiting. Get medical aid immediately. Call a poison control center.

Inhalation: Remove from exposure and move to fresh air immediately. If breathing is difficult, give oxygen. SPEED IS ESSENTIAL. OBTAIN MEDICAL AID IMMEDIATELY. Do not use mouth-to-mouth resuscitation if victim ingested or inhaled the substance; induce artificial respiration with the aid of a pocket mask equipped with a one-way valve or other proper respiratory medical device.

Notes to Physician: Treat symptomatically and supportively.

Section 5 - Fire Fighting Measures

As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. During a fire, irritating and highly toxic gases may be generated by thermal decomposition or combustion. Use water spray to keep fire-exposed containers cool. Contact with metals may evolve flammable hydrogen gas. Containers may explode when heated. Approach fire from upwind to avoid hazardous vapors and toxic decomposition products. Ammonium hydroxide itself is non-combustible. However concentrated ammonia solutions may give off ammonia vapours. Ammonia gas is generally not considered a serious fire or explosion hazard because ammonia/air mixtures are difficult to ignite. A relatively high concentration of ammonia gas must be present in order for ignition to occur. However, a large and intense energy source may cause ignition and/or explosion in a confined space.

Extinguishing Media: Use extinguishing media most appropriate for the surrounding fire.

Autoignition Temperature: Not applicable.

Flash Point: Not available

Explosion Limits: Lower:

Explosion Limits: Upper:

NFPA Rating: health: 3; flammability: 0; instability: 0;

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.

Spills/Leaks: Absorb spill with inert material (e.g. vermiculite, sand or earth), then place in suitable container. Wear a self contained breathing apparatus and appropriate personal protection. (See Exposure Controls, Personal Protection section). Provide ventilation. Evacuate unnecessary personnel. Do not let this chemical enter the environment.

Section 7 - Handling and Storage

Handling: Do not get in eyes, on skin, or on clothing. Do not ingest or inhale. Use only in a chemical fume hood.

Storage: Store in a cool, dry place. Do not store in direct sunlight. Store in a tightly closed container. Corrosives area.

Section 8 - Exposure Controls, Personal Protection
OSHA Vacated PELs: Ammonium hydroxide: None listed Ammonia: None listed Water: None listed

Engineering Controls:
Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower. Use only under a chemical fume hood.

Exposure Limits

Personal Protective Equipment

Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA’s eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin: Wear appropriate protective gloves to prevent skin exposure.

Clothing: Wear appropriate protective clothing to prevent skin exposure.

Follow the OSHA respirator regulations found in 29 CFR 1910.134 or European Standard EN 149. Use a Respirators: NIOSH/MSHA or European Standard EN 149 approved respirator if exposure limits are exceeded or if irritation or other symptoms are experienced.

Section 9 - Physical and Chemical Properties

Physical State: Liquid
Color: clear, colorless
Odor: strong odor - ammonia-like
pH: 13.6
Vapor Pressure: 557 mm Hg @ 21 deg C
Vapor Density: 0.59 (air=1)
Evaporation Rate: Not available
Viscosity: Not available
Boiling Point: 27 deg C (80.60°F)
Freezing/Melting Point: -69 deg C (-92.20°F)
Decomposition Temperature: Not available
Solubility in water: Soluble
Specific Gravity/Density: 0.89
Molecular Formula: NH4OH
Molecular Weight: 35.04

Section 10 - Stability and Reactivity

Chemical Stability: Stable under normal temperatures and pressures.
Conditions to Avoid: Incompatible materials, excess heat, confined spaces.
Incompatibilities with Other Materials: Strong oxidizing agents, acids, acrolein, halogens, mercury, hypochlorite, silver nitrate, acrylic acid, dimethyl sulfate, silver oxide.
Hazardous Decomposition Products: Nitrogen oxides (NOx) and ammonia (NH3).
Hazardous Polymerization: Will not occur.

Section 11 - Toxicological Information

CAS# 1336-21-6: BQ9625000
RTECS#: CAS# 7664-41-7: BO875000
CAS# 7732-18-5: ZC0110000
RTECS:
CAS# 1336-21-6: Draize test, rabbit, eye: 250 µg Severe; Oral, rat: LD50 = 350 mg/kg;

RTECS:
CAS# 7664-41-7: Inhalation, mouse: LC50 = 4230 ppm/1H; Inhalation, rabbit: LC50 = 7 gm/m3/1H;
Inhalation, mouse: LC50 = 4600 mg/m3/2H;
Inhalation, rat: LC50 = 2000 ppm/4H;
LD50/LC50: Inhalation, rat: LC50 = 18600 mg/m3/5M;
Inhalation, rat: LC50 = 7040 mg/m3/30M;
Skin, rat: LD50 = 112000 mg/m3/15M;
Skin, rat: LD50 = 71900 mg/m3/30M;
Skin, rat: LD50 = 4840 mg/m3/60M;

RTECS:
CAS# 7732-18-5: Oral, rat: LD50 = >90 mL/kg;

Carcinogenicity: Ammonium hydroxide - Not listed as a carcinogen by ACGIH, IARC, NTP, or CA Prop 65.
Ammonia - Not listed as a carcinogen by ACGIH, IARC, NTP, or CA Prop 65.
Water - Not listed as a carcinogen by ACGIH, IARC, NTP, or CA Prop 65.

Other: See actual entry in RTECS for complete information.

Section 12 - Ecological Information

Fish: Rainbow trout: LC50 = 0.008 mg/L; 24 Hr.; Unspecified
Fish: Fathead Minnow: LC50 = 8.2 mg/L; 96 Hr.; Unspecified
Ecotoxicity: Fish: Bluegill/Sunfish: LC50 = 0.024-0.093 mg/L; 48 Hr.; Unspecified
Water flea Daphnia: EC50 =0.66 mg/L; 48 Hr.; 22 degrees C

Other: Do not empty into drains.

Section 13 - Disposal Considerations
Dispose of in a manner consistent with federal, state, and local regulations.

Section 14 - Transport Information

US DOT
Shipping Name: AMMONIA SOLUTIONS
Hazard Class: 8
UN Number: UN2672
Packing Group: III

Canada TDG
Shipping Name: AMMONIA SOLUTION
Hazard Class: 8
UN Number: UN2672
Packing Group: III

USA RQ: CAS# 1336-21-6: 1000 lb final RQ; 454 kg final RQ
USA RQ: CAS# 7664-41-7: 100 lb final RQ; 45.4 kg final RQ

Section 15 - Regulatory Information

European/International Regulations
European Labeling in Accordance with EC Directives
Hazard Symbols: C N
Risk Phrases:
R 34 Causes burns.
R 50 Very toxic to aquatic organisms.
Safety Phrases:
S 26 In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.
S 36/37/39 Wear suitable protective clothing, gloves and eye/face protection.
S 45 In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible).
S 61 Avoid release to the environment. Refer to special instructions/safety data sheets.

WGK (Water Danger/Protection)
CAS# 1336-21-6: 2
CAS# 7664-41-7: 2
CAS# 7732-18-5: Not available

Canada
CAS# 1336-21-6 is listed on Canada's DSL List
CAS# 7664-41-7 is listed on Canada's DSL List
CAS# 7732-18-5 is listed on Canada's DSL List
Canadian WHMIS Classifications: D1B, E

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all of the information required by those regulations.
CAS# 1336-21-6 is listed on Canada's Ingredient Disclosure List
CAS# 7664-41-7 is listed on Canada's Ingredient Disclosure List
CAS# 7732-18-5 is not listed on Canada's Ingredient Disclosure List.

US Federal
TSCA
CAS# 1336-21-6 is listed on the TSCA Inventory.
CAS# 7664-41-7 is listed on the TSCA Inventory.
CAS# 7732-18-5 is listed on the TSCA Inventory.

Section 16 - Other Information
MSDS Creation Date: 6/22/1999
Revision #19 Date 7/20/2009

The information above is believed to be accurate and represents the best information currently available to us. However, we make no warranty of merchantability or any other warranty, express or implied, with respect to such information, and we assume no liability resulting from its use. Users should make their own investigations to determine the suitability of the information for their particular purposes. In no event shall the company be liable for any claims, losses, or damages of any third party or for lost profits or any special, indirect, incidental, consequential, or exemplary damages howsoever arising, even if the company has been advised of the possibility of such damages.